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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,937	08/26/2003	James L. Hadder	H0004989	5923

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EXAMINER

RODRIGUEZ, WILLIAM H

ART UNIT	PAPER NUMBER
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3746

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/648,937	Applicant(s) HADDER, JAMES L.	
	Examiner William H. Rodriguez	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 and 19-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-18, 25-27 and 29 is/are rejected.
- 7) ☒ Claim(s) 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This office action is in response to the amendment and remarks filed 6/10/05. Since the examiner has applied new grounds of rejection, this office action is being made non-final to afford the applicant the opportunity to respond to the new grounds of rejection.

Claim Objections

1. Claims 8-11 and 13-17 are objected to because of the following informalities:

With regards to claim 8, the recitation "a gas injector comprising the gas turbine engine" in lines 5-6 is presumed to be --a gas injector **of** the gas turbine engine-- for proper clarity. Appropriate correction is required.

With regards to claim 9, the recitation "a gas injector comprising the gas turbine engine" in lines 6-7 is presumed to be --a gas injector **of** the gas turbine engine-- for proper clarity. Appropriate correction is required.

With regards to claim 10, the recitation "the cooling tube" in lines 1-2 is presumed to be -the **serpentine** cooling tube-- for proper antecedent basis. Appropriate correction is required.

With regards to claim 11, the recitation "a gas injector comprising the gas turbine engine" in line 9 is presumed to be --a gas injector **of** the gas turbine engine-- for proper clarity. Appropriate correction is required.

With regards to claim 13, the recitation "is maintained a spaced distance" in line 2 is presumed to be -- is maintained **at** a spaced distance -- for proper clarity. Appropriate correction is required.

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With regards to claim 14, the recitation "a gas injector comprising the gas turbine engine" in lines 8-9 is presumed to be --a gas injector **of** the gas turbine engine-- for proper clarity. Appropriate correction is required.

With regards to claim 14, the recitation "to maintain the serpentine cooling tube a spaced distance from" in lines 10-11 is presumed to be --to maintain the serpentine cooling tube **at** a spaced distance from-- for proper clarity. Appropriate correction is required.

With regards to claim 14, the recitation "the cooling tube" in lines 12 is presumed to be --the **serpentine** cooling tube-- for proper antecedent basis. Appropriate correction is required.

With regards to claim 15, the recitation "the cooling tube" in line 3 is presumed to be --the **serpentine** cooling tube-- for proper antecedent basis. Appropriate correction is required.

With regards to claims 16 and 17, the recitation "the plurality of cooling tubes" in line 2 is presumed to be --the plurality of **serpentine** cooling tubes-- for proper antecedent basis. Appropriate correction is required.

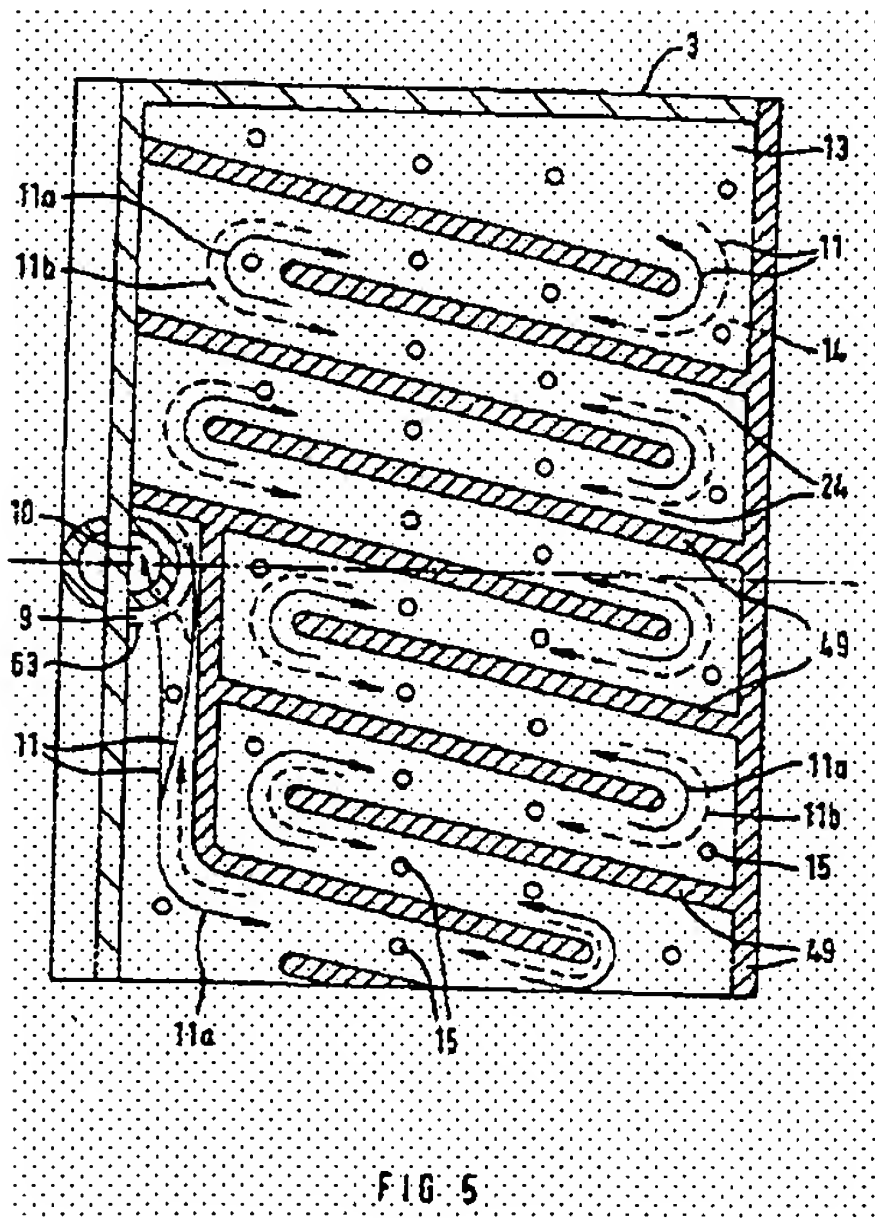
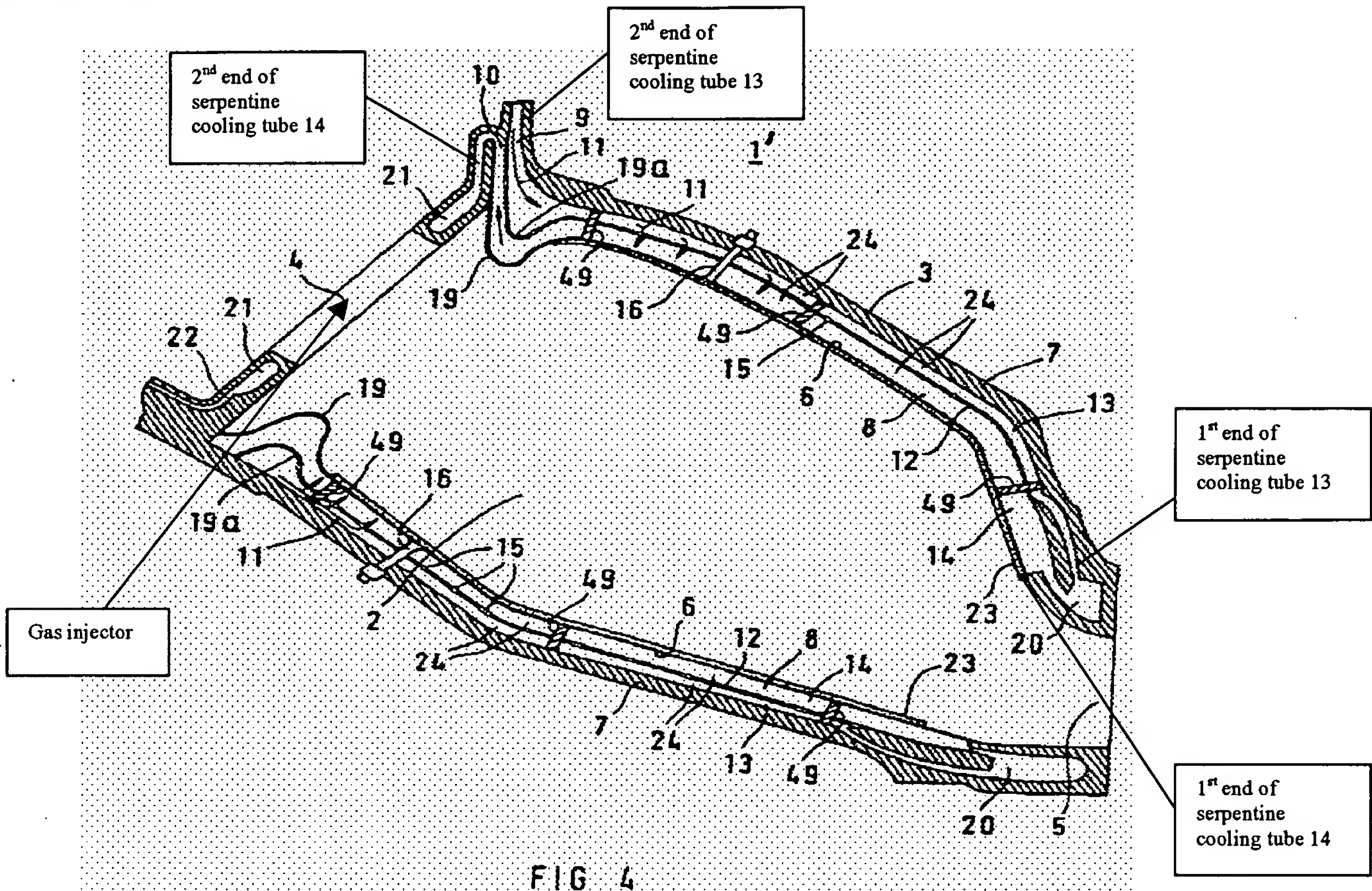
Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 8-18, 25-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Liebe (US 6,341,485)** in view of **Peterson et al. (US 2,446,059)**.

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Figures 4 and 5 of Liebe

With respect to claims 8, 9 and 11, **Liebe** teaches a cooling tube assembly for cooling a liner (3, 6) of a combustor chamber of a gas turbine engine, the assembly comprising: a plurality of serpentine cooling tubes (13, 14), each serpentine tube conforming to a contour of the liner, each serpentine tube including: a first end in fluid communication with a plenum supplying a fluid to cool the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector of the gas turbine engine, and a centerline extending from the first end to the second end, wherein the centerline, the first end, and the second end are non-linear when projected onto a plane, wherein each cooling tube has a serpentine shape (see column 5 lines 53 to column 6 line 6) conforming to a contour of the liner (see particularly **Figures 4, 5** of **Liebe**). **Liebe** does not mention that the cooling fluid supplied to the serpentine cooling tubes (13, 14) is air but steam. However, **Liebe** does not restrict supplying the serpentine cooling tubes with steam only, but he only mentions that steam is preferred (column 6 line 66 of **Liebe**). Nevertheless, **Peterson** teaches an apparatus similar to **Liebe** comprising a cooling tube 37 for cooling a liner 41 of a combustor chamber of a gas turbine engine, comprising: the cooling tube having a first end in fluid communication with a plenum supplying air to the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector 30 of the gas turbine engine, wherein the cooling tube has a serpentine shape conforming to a contour of the liner and the serpentine shape of the cooling tube allows the cooling tube to expand and contract in response to temperature gradients in the combustor chamber (see particularly **Figures 2-4** of **Peterson**). Therefore, **Peterson** teaches that it was well known to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used air as a cooling fluid for a combustor being cooled by serpentine cooling tubes. Thus, as taught by **Peterson** and

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since Liebe does not restrict his invention to steam, it would have been obvious to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used the teachings of Peterson and have supplied Liebes' serpentine cooling tubes 13, 14 with air because air was a well known and commonly used cooling fluid for cooling combustor liners.

*The desired result recitation "the serpentine shape of the cooling tube **allows** the cooling tube to expand and contract in response to temperature gradients in the combustor chamber" is not given patentable weight because the recitation does not further limit the claim and does not help differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims, as is the case here.

With respect to claim 10, **Liebe** teaches that the cooling tube 14 is positioned outside the combustor chamber liner 3. See particularly **Figure 4** of Liebe.

With respect to claim 12, **Liebe** teaches the cooling tube assembly is in contact with the liner (3, 6). See particularly **Figure 4** of Liebe.

With respect to claim 13, **Liebe** teaches that the cooling tube is maintained a spaced distance from the liner. See particularly **Figure 4** of Liebe.

With respect to claim 14, **Liebe** teaches a cooling tube assembly for cooling a liner (3, 6) of a combustor chamber of a gas turbine engine, the assembly comprising: a plurality of serpentine cooling tubes (13, 14), each serpentine tube conforming to a contour of the liner, each serpentine tube including: a first end in fluid communication with a plenum supplying a fluid to cool the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector of the gas turbine engine, each serpentine cooling tube supported by a plurality of pins 16 to maintain the serpentine cooling tube at a spaced distance from the liner,

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and each pin 16 having a proximal end attached to the cooling tube and a distal end inserted through the liner (see particularly **Figures 4, 5** of Liebe). **Liebe** does not mention that the cooling fluid supplied to the serpentine cooling tubes (13, 14) is air but steam. However, **Liebe** does not restrict supplying the serpentine cooling tubes with steam only, but he only mentions that steam is preferred (column 6 line 66 of Liebe). Nevertheless, **Peterson** teaches an apparatus similar to **Liebe** comprising a cooling tube 37 for cooling a liner 41 of a combustor chamber of a gas turbine engine, comprising: the cooling tube having a first end in fluid communication with a plenum supplying air to the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector 30 of the gas turbine engine, wherein the cooling tube has a serpentine shape conforming to a contour of the liner and the serpentine shape of the cooling tube allows the cooling tube to expand and contract in response to temperature gradients in the combustor chamber (see particularly **Figures 2-4** of Peterson). Therefore, **Peterson** teaches that it was well known to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used air as a cooling fluid for a combustor being cooled by serpentine cooling tubes. Thus, as taught by **Peterson** and since Liebe does not restrict his invention to steam, it would have been obvious to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used the teachings of Peterson and have supplied Liebes' serpentine cooling tubes 13, 14 with air because air was a well known and commonly used cooling fluid for cooling combustor liners.

*The desired result recitation "the distal end being secured from removal from the hole in a manner allowing rotational movement of the pin within the hole" is not given patentable weight because the recitation does not further limit the claim and does not help differentiate the

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claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims, as is the case here.

With respect to claim 15, **Liebe** teaches each cooling tube is fabricated of a metallic material, and the proximal end is secured to the liner. The recitation “by brazing” is rejected over a prior art product that appears to be identical, although produced by a different process, the burden is upon the applicants to come forward with evidence establishing an unobvious difference between the two. See *In re Marosi*, 218 USPQ 289 (Fed. Cir. 1983)

With respect to claim 16, **Liebe** teaches that the cooling tube 14 is positioned on an exterior side of the liner 6. See particularly **Figure 4** of **Liebe**.

With respect to claim 17, **Liebe** teaches that the cooling tube 13 is positioned on an interior side of the liner 3. See particularly **Figure 4** of **Liebe**.

With respect to claim 18, **Liebe** teaches that the serpentine shape of each tube is formed as a plurality of alternating bends along a length of each tube. See particularly **Figure 4** of **Liebe**.

With respect to claims 25-27 and 29, **Liebe** teaches a cooling tube assembly for cooling a liner (3, 6) of a combustor chamber of a gas turbine engine, the assembly comprising: a plurality of serpentine cooling tubes (13, 14), each serpentine tube conforming to a contour of the liner, each serpentine tube including: a first end in fluid communication with a plenum supplying a fluid to cool the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector of the gas turbine engine, each serpentine cooling tube supported by a plurality of pins 16 to maintain the serpentine cooling tube at a spaced distance from the liner, and each pin 16 having a proximal end attached to the cooling tube and a distal end inserted through the liner; and a centerline extending from the first end to the second end,

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wherein the centerline, the first end, and the second end are non-linear when projected onto a plane, (see particularly **Figures 4, 5** of Liebe). **Liebe** does not mention that the cooling fluid supplied to the serpentine cooling tubes (13, 14) is air but steam. However, **Liebe** does not restrict supplying the serpentine cooling tubes with steam only, but he only mentions that steam is preferred (column 6 line 66 of Liebe). Nevertheless, **Peterson** teaches an apparatus similar to **Liebe** comprising a cooling tube 37 for cooling a liner 41 of a combustor chamber of a gas turbine engine, comprising: the cooling tube having a first end in fluid communication with a plenum supplying air to the combustor chamber, and a second end in fluid communication with an area in proximity with a gas injector 30 of the gas turbine engine, wherein the cooling tube has a serpentine shape conforming to a contour of the liner and the serpentine shape of the cooling tube allows the cooling tube to expand and contract in response to temperature gradients in the combustor chamber (see particularly **Figures 2-4** of Peterson). Therefore, **Peterson** teaches that it was well known to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used air as a cooling fluid for a combustor being cooled by serpentine cooling tubes. Thus, as taught by **Peterson** and since Liebe does not restrict his invention to steam, it would have been obvious to a combustor designer (one of ordinary skill in the art) at the time the invention was made to have used the teachings of Peterson and have supplied Liebes' serpentine cooling tubes 13, 14 with air because air was a well known and commonly used cooling fluid for cooling combustor liners. Since Liebe in view of Peterson has the same structure as claimed, it is inherent that Liebe in view of Peterson device would be able to perform the recited method steps.

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Response to Arguments

4. Applicant's arguments with respect to claims 8-18, 25-27 and 29 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

5. The indicated allowability of claims 9, 14, 15, 17, 26 and 29 is withdrawn in view of the newly discovered reference(s) to **Liebe (US 6,341,485)**. See detailed rejection above.

Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact information


Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Rodriguez whose telephone number is 571-272-4831.

The examiner can normally be reached on Monday-Friday 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on 571-272-4444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William H. Rodriguez
Examiner
Art Unit 3746

S/15/07